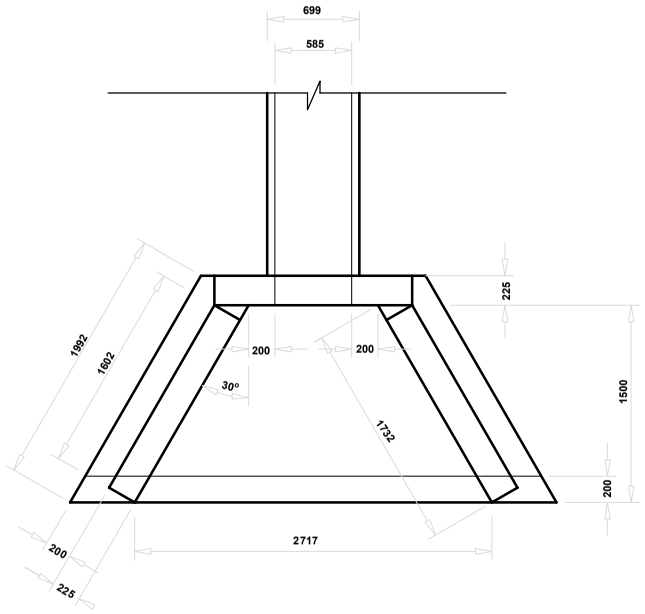
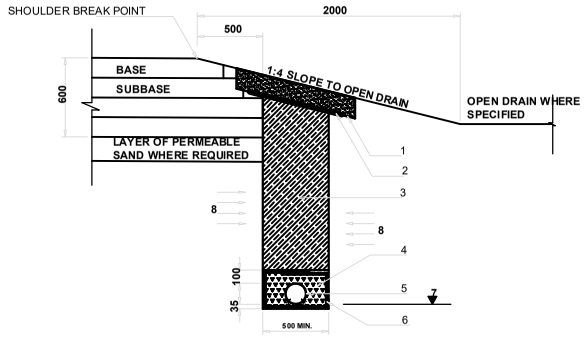


PLAN VIEW OF TYPICAL CULVERT TO BE UPGRADED AT ANGLE = 0°

SCALE 1:50



SUBSOIL DRAIN WITH SYNTHETIC FIBRE FILTER FABRIC

SCALE 1:20

LEGEND	
NO	DESCRIPTION
1	IMPERMEABLE BACKFILL MATERIAL (MIN. 150mm THICK) IN CASES WHERE CONCRETE SIDE DRAIN IS NOT PROVIDED
2	375 MICRON BLACK POLYETHYLENE DAMP-PROOF LINING
3	FILTER SAND OF APPROVED SOURCE AND GRADE
4	FILTER STONE: FINE OR COURSE GRADE AS REQUIRED (SEE SUBCLAUSE 2104(a)(ii) OF THE STANDARD SPECIFICATIONS
5	PERFORATED/ SLOTTED SUBSOIL DRAINAGE PIPES 110mm OR 160mm DIA. (POSITIONS OF PERFORATIONS INDICATED)
6	SYNTHETIC FIBRE FILTER FABRIC WITH 200mm OVERLAP (GRADE 2 OR APPROVED EQUIVALENT)
7	DEPTH TO WHICH SURROUNDING AREA IS TO BE DRAINED
8	WATER BEARING STRATA

NOTES:

1. ALL CRITERIA ASSUMES THAT THE FILTER SAND AND FILTER STONE ARE CONTINUOSLY GRADED FROM COARSE TO FINE.
2. POLYETHYLENE LINING MAY BE OMITTED WHERE SUBSOIL DRAIN IS INSTALLED IN SOLID ROCK.
3. TYPE A OUTLET PREFERABLE TO BE USED WHERE THE NATURAL GROUND LEVEL ALLOWS IT. OUTLETS MAY ALSO BE COMBINED WITH CULVERTS INLETS AND OUTLETS.
4. ALL CONCRETE SHALL BE CLASS 25/19.
5. SPACING OF CLEANING EYES TO BE AS FOLLOWS:
   (a) AT THE BEGINNING OF THE SUBSOIL DRAIN.
   (b) 100m MAX. ON STRAIGHT SECTIONS.
   (c) AT ALL BENDS.
   (d) OR AS DIRECTED BY THE ENGINEER.
6. PLATE WITH THE INSCRIPTION "CLEANING EYE FOR SUBSOIL DRAIN" STAMPED ON TO BE AFFIXED TO CONCRETE COVER.
7. LETTER SIZES ON PLATE: 10mm SERIES C, CAPITAL LETTERS.
8. SYNTHETIC FIBRE FILTER FABRIC TO BE REPLACED WITH POLYETHYLENE LINING IN THE FOLLOWING INSTANCES:
   (a) WHERE THE SURROUNDING SOIL IS VERY PERMIOUS.
   (b) WHERE THE SURROUNDING SOIL HAS A HIGH FINES CONTENT
   THAT COULD LEAD TO CLOGGING.
9. TYPICAL DEPTHS OF SUBSOILS FOR A 12m WIDE ROAD SUBJECT TO THE APPROVAL OF THE ENGINEER:
   (a) 1.2m FOR SANDY MATERIAL (K = 10^{-7} cm/sec)
   (b) 1.7m FOR SILTY SAND (K = 10^{-8} cm/sec)
   (c) 1.5m IF UNSURE REGARDING THE TYPE OF MATERIAL
10. LAYER OF DRAINABLE PERMEABLE SAND TO BE DAYLIGHTED INTO THE SUBSURFACE DRAIN.

FILTER CRITERIA

A. SYNTHETIC FIBRE FILTER FABRIC (SF)

"D x" IS THE SIZE OF THE SIEVE THROUGH WHICH x% OF THE FILTER MATERIAL WILL PASS.
O^{90} (GF) = AVERAGE SIZE OF THE OPENINGS OF THE SYNTHETIC FIBRE FILTER FABRIC.

B. FILTER SAND (FS) IN RELATION TO WATER BEARING STRATA (WS)

1. FOR D^{85} (WS) > 0.05mm:
(a) TO PREVENT BLOCKING OF FILTER SAND:
D^{15} (FS) < 5 x D^{85} (WS)
D^{50} (FS) < 25 x D^{50} (WS)
(b) FOR PERMEABILITY OF FILTER SAND:
D^{15} (FS) > 5 x D^{15} (WS)

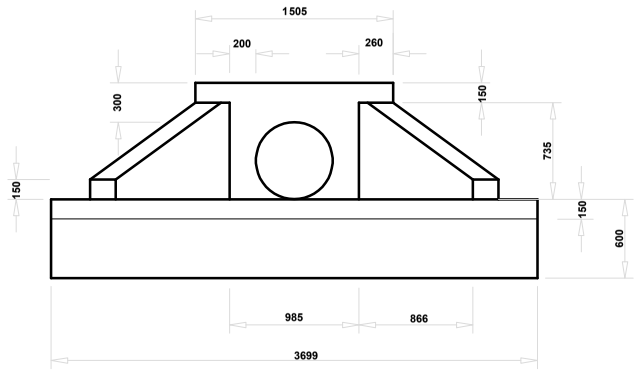
2. FOR D^{85} (WS) < 0.05mm
(a) TO PREVENT BLOCKING OF FILTER SAND:
D^{15} (FS) < 0.25mm
D^{50} (FS) > 0.075mm
(b) PERMEABILITY REQUIREMENTS NOT NECESSARY

C. FILTER STONE (FSN) IN RELATION TO FILTER SAND (FS)
(a) TO PREVENT BLOCKING OF FILTER STONE:
D^{15} (FSN) < 5 x D^{85} (FS)
D^{50} (FSN) < 25 x D^{50} (FS)
(b) PERMEABILITY: FILTER STONE MUST BE COARSER THAN SAND AT ALL PERCENTAGES

D. FILTER STONE (FSN) IN RELATION TO PERFORATIONS IN PIPES

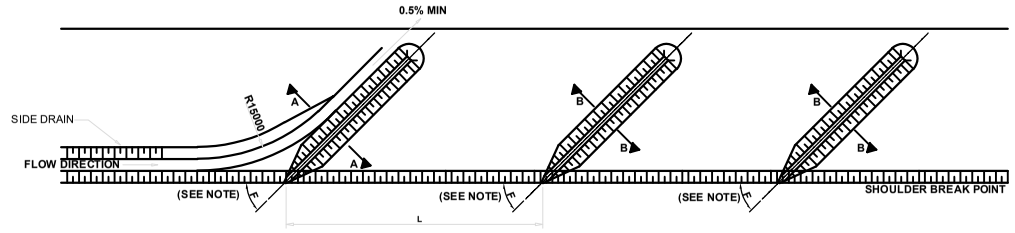
TO PREVENT BLOCKING OF PERFORATIONS IN PIPES:
D^{85} (FSN) > 1.2 x DIA. OF ROUND PERFORATIONS
D^{85} (FSN) > 1.2 x WIDTH OF SLOTS

E. SYNTHETIC FIBRE FILTER FABRIC (SF) IN RELATION TO FILTER SAND (FS)
(a) TO PREVENT CLOGGING OF SYNTHETIC FIBRE FILTER FABRIC: O^{90} (SF) < D^{85} (FS)
(b) FOR PERMEABILITY OF SYNTHETIC FIBRE FILTER FABRIC:
O^{50} (SF) > D^{15} (FS)



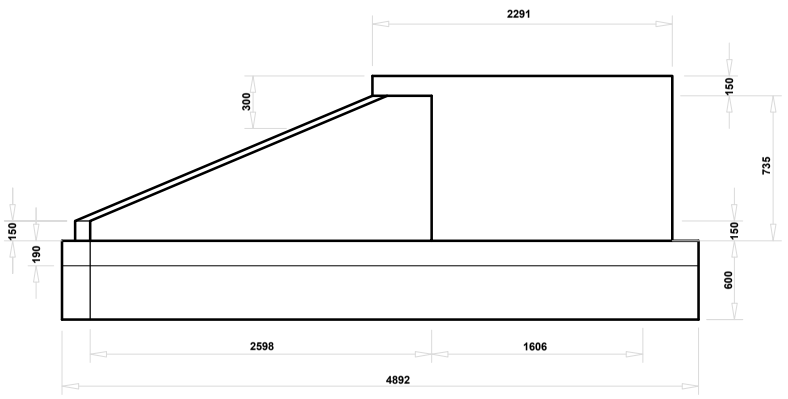
ELEVATION VIEW: ANGLE = 0°

SCALE 1:50



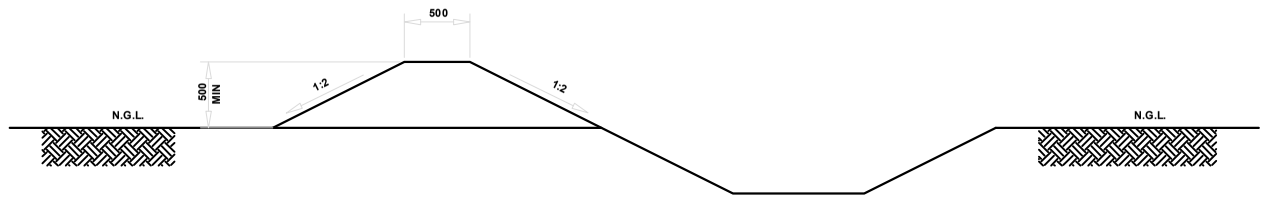
PLAN OF MITRE BANKS

SCALE N.T.S.



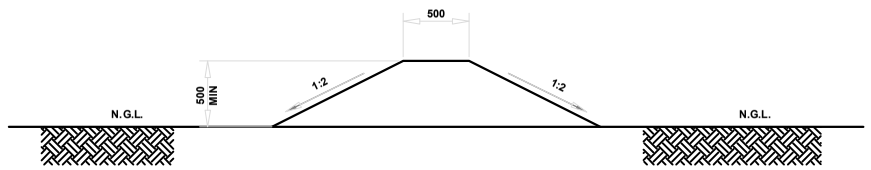
WING WALL

SCALE 1:20



SECTION A-A

Sale 1:50



SECTION B-B

Sale 1:50

NOTES (MITRE BANKS)

1) DIMENSION (L) AND ANGLE (F) SHOULD BE DETERMINED BY NATURAL TOPOGRAPHY TO PROVIDE A SLOPE OF 0.5% ALONG THE BERM.
2) OPEN DRAINS SHOULD BE INCORPORATED ALONG BERMS WHERE REQUIRED.
3) TOP OF BERM TO BE ATLEAST 100mm BELOW SHOULDER BREAK POINT.
4) ANGLE TO BE DETERMINED BY ENGINEER ACCORDING TO TOPOGRAPHY.

DESIGNED BY:	M.M.S
DRAWN BY:	TM
CHECKED BY:	M.M.S
ISSUED BY:	M.M.S

INFORMATION
Full Signatures

For Client

For Consulting Engineer

Consultant's Drawing No.:

APPROVED

For Client
20 / /

For Consulting Engineer
20 / /

NO.	REVISION DETAILS	REV NO.	DATE	REVISED BY	APPRVD BY
0	ISSUED FOR TENDER PURPOSES	0	FEB. 2023		

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TENDER NUMBER: COM 08/2023

UPGRADING OF MASOYI POLICE STATION TO DINGINDODA ROAD WARD 6

DRAINAGE SCHEDULE

SHEET 1 OF 1

SCALE: AS SHOWN

DRAWING NO:
COM 08/2023/019

REVISION 00